

SUPPLIER DATABASE:

create database SUPPLIER;

use SUPPLIER;

create table SUPPLIERS(sid BIGINT(5) primary key, sname varchar(20), city varchar(20));

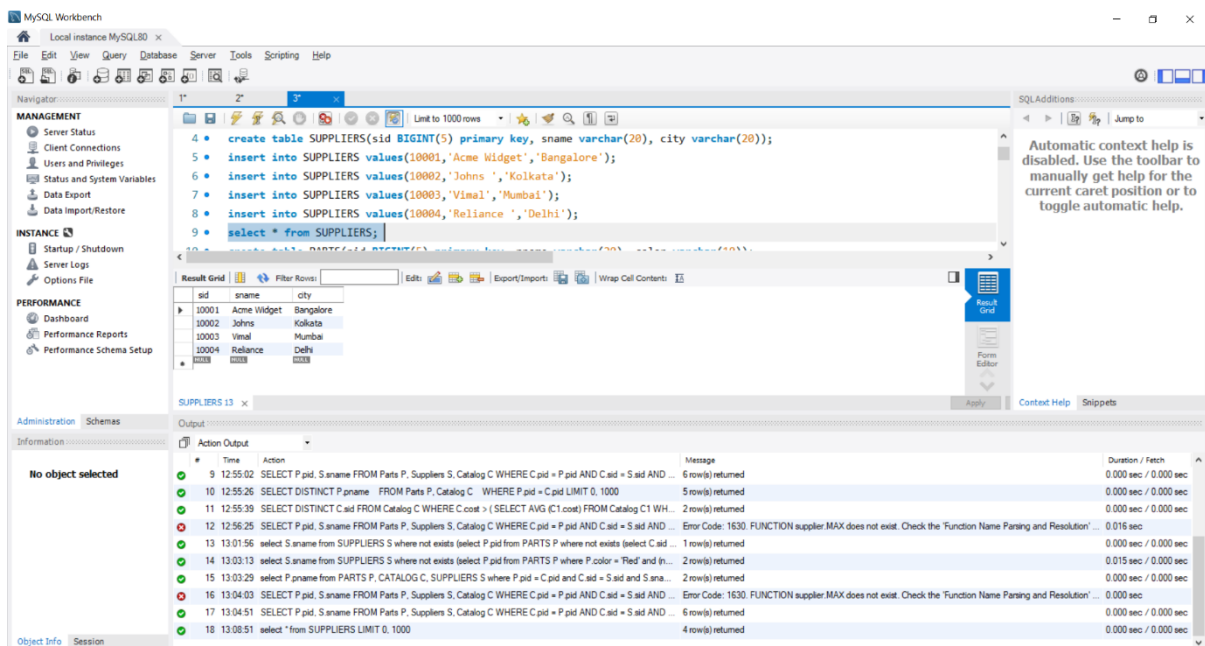
insert into SUPPLIERS values(10001,'Acme Widget','Bangalore');

insert into SUPPLIERS values(10002,'Johns ','Kolkata');

insert into SUPPLIERS values(10003,'Vimal','Mumbai');

insert into SUPPLIERS values(10004,'Reliance ','Delhi');

select * from SUPPLIERS;



create table PARTS(pid BIGINT(5) primary key, pname varchar(20), color varchar(10));

insert into PARTS values(20001,'Book','RED');

insert into PARTS values(20002,'Pen','RED');

insert into PARTS values(20003,'Pencil','Green');

insert into PARTS values(20004,'Mobile ','Green');

insert into PARTS values(20005,'Charger','Black');

select * from PARTS;

The screenshot displays the MySQL Workbench interface. The SQL editor contains the following queries:

```
13 • insert into PARTS values(20003,'Pencil','Green');
14 • insert into PARTS values(20004,'Mobile ','Green');
15 • insert into PARTS values(20005,'Charger','Black');
16 • select * from PARTS;
17 • delete from PARTS where pid=10001;
18 • create table CATALOG(sid BIGINT(5), pid BIGINT(5), foreign key(sid) references SUPPLIERS(sid), foreign key(pid) references PARTS(pid));
19 • insert into CATALOG(sid) values(10001, 20001, 10);
```

The Results tab shows the output of the `select * from PARTS;` query:

pid	pname	color
20001	Book	RED
20002	Pen	RED
20003	Pencil	Green
20004	Mobile	Green
20005	Charger	Black

The Output tab shows the execution log with the following entries:

#	Time	Action	Message	Duration / Tech
20	13:09:26	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
21	13:09:50	SELECT DISTINCT P.pname FROM Parts P, Catalog C WHERE P.pid = C.pid LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
22	13:10:17	SELECT DISTINCT C.sid FROM Catalog C WHERE C.cost > (SELECT AVG (C1.cost) FROM Catalog C1 WHERE C1.cost > C.cost)	2 row(s) returned	0.000 sec / 0.000 sec
23	13:10:17	SELECT DISTINCT C.sid FROM Catalog C WHERE C.cost > (SELECT AVG (C1.cost) FROM Catalog C1 WHERE C1.cost > C.cost)	2 row(s) returned	0.000 sec / 0.000 sec
24	13:10:31	SELECT P.pid, S.sname FROM Parts P, Suppliers S, Catalog C WHERE C.pid = P.pid AND C.sid = S.sid AND C.cost > (SELECT AVG (C1.cost) FROM Catalog C1 WHERE C1.cost > C.cost)	6 row(s) returned	0.000 sec / 0.000 sec
25	13:10:43	select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where not exists (select C.sid from CATALOG C where C.pid = P.pid and C.sid = S.sid and C.cost > (select avg(C1.cost) from CATALOG C1 where C1.cost > C.cost)))	1 row(s) returned	0.000 sec / 0.000 sec
26	13:11:06	select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where P.color = 'Red' and not exists (select C.sid from CATALOG C where C.pid = P.pid and C.sid = S.sid and C.cost > (select avg(C1.cost) from CATALOG C1 where C1.cost > C.cost)))	2 row(s) returned	0.000 sec / 0.000 sec
27	13:11:18	select P.pname from PARTS P, CATALOG C, SUPPLIERS S where P.pid = C.pid and C.sid = S.sid and S.sname = 'Pencil'	2 row(s) returned	0.000 sec / 0.000 sec
28	13:16:20	select * from SUPPLIERS LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
29	13:16:32	select * from PARTS LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec

create table CATALOG(sid BIGINT(5), pid BIGINT(5), foreign key(sid) references SUPPLIERS(sid), foreign key(pid) references PARTS(pid), cost float(6), primary key(sid, pid));

insert into CATALOG values(10001,20001,10);

insert into CATALOG values(10001,20002,10);

insert into CATALOG values(10001,20003,30);

insert into CATALOG values(10001,20004,10);

insert into CATALOG values(10001,20005,10);

insert into CATALOG values(10002,20001,10);

insert into CATALOG values(10002,20002,20);

insert into CATALOG values(10003,20003,30);

insert into CATALOG values(10004,20003,40);

select * from CATALOG;

The screenshot shows the MySQL Workbench interface. The SQL editor contains the following queries:

```
25 • insert into CATALOG values(10002,20002,20);
26 • insert into CATALOG values(10003,20003,30);
27 • insert into CATALOG values(10004,20003,40);
28 • select * from CATALOG;
```

The Result Grid displays the data from the CATALOG table:

sid	pid	cost
10001	20002	10
10001	20003	30
10001	20004	10
10001	20005	10
10002	20001	10
10002	20002	20
10003	20003	30
10004	20003	40

The Output tab shows the execution log:

#	Time	Action	Message	Duration / Fetch
21	13:09:50	SELECT DISTINCT P.pname FROM Parts P, Catalog C WHERE P.pid = C.pid LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
22	13:10:17	SELECT DISTINCT C.aid FROM Catalog C WHERE C.cost > (SELECT AVG (C1.cost) FROM Catalog C1 WHERE C1.aid = C.aid)	2 row(s) returned	0.000 sec / 0.000 sec
23	13:10:17	SELECT DISTINCT C.aid FROM Catalog C WHERE C.cost > (SELECT AVG (C1.cost) FROM Catalog C1 WHERE C1.aid = C.aid)	2 row(s) returned	0.000 sec / 0.000 sec
24	13:10:31	SELECT P.pid, S.sname FROM Parts P, Suppliers S, Catalog C WHERE C.pid = P.pid AND C.aid = S.aid AND S.sname = 'Red'	6 row(s) returned	0.000 sec / 0.000 sec
25	13:10:43	select S.sname from Suppliers S where not exists (select P.pid from Parts P where not exists (select C.aid from Catalog C where C.pid = P.pid and C.aid = S.aid and S.sname = 'Red'))	1 row(s) returned	0.000 sec / 0.000 sec
26	13:11:06	select S.sname from Suppliers S where not exists (select P.pid from Parts P where P.color = 'Red' and P.pname = S.pname)	2 row(s) returned	0.000 sec / 0.000 sec
27	13:11:18	select P.pname from Parts P, Catalog C, Suppliers S where P.pid = C.pid and C.aid = S.aid and S.sname = 'Red'	2 row(s) returned	0.000 sec / 0.000 sec
28	13:16:20	select * from Suppliers LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
29	13:16:32	select * from Parts LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
30	13:16:48	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec

```
/* 1 */
```

```
SELECT DISTINCT P.pname
```

```
FROM Parts P, Catalog C
```

```
WHERE P.pid = C.pid;
```

The screenshot shows the MySQL Workbench interface. The SQL editor contains the following query:

```
28 select * from CATALOG;
29 /* 1 */
30 SELECT DISTINCT P.pname
31 FROM Parts P, Catalog C
32 WHERE P.pid = C.pid;
33 /* 2
34 SELECT S.sname FROM SUPPLIERS S
```

The Results tab shows the output of the query, displaying a table with one column, `pname`, and five rows of data:

pname
Book
Pen
Pencil
Mobile
Charger

The Output tab shows the execution log, including the following messages:

```
12 12:56:25 SELECT P.pid, S.sname FROM Parts P, Suppliers S, Catalog C WHERE C.pid = P.pid AND C.cid = S.cid AND ... Error Code: 1630: FUNCTION supplier.MAX does not exist. Check the 'Function Name Parsing and Resolution' ... 0.016 sec
13 13:01:56 select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where not exists (select C.cid ... 1 row(s) returned 0.000 sec / 0.000 sec
14 13:03:13 select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where P.color = 'Red' and in ... 2 row(s) returned 0.015 sec / 0.000 sec
15 13:03:29 select P.pname from PARTS P, CATALOG C, SUPPLIERS S where P.pid = C.cid and C.cid = S.cid and S.sna ... 2 row(s) returned 0.000 sec / 0.000 sec
16 13:04:03 SELECT P.pid, S.sname FROM Parts P, Suppliers S, Catalog C WHERE C.pid = P.pid AND C.cid = S.cid AND ... Error Code: 1630: FUNCTION supplier.MAX does not exist. Check the 'Function Name Parsing and Resolution' ... 0.000 sec
17 13:04:51 SELECT P.pid, S.sname FROM Parts P, Suppliers S, Catalog C WHERE C.pid = P.pid AND C.cid = S.cid AND ... 6 row(s) returned 0.000 sec / 0.000 sec
18 13:08:51 select * from SUPPLIERS LIMIT 0, 1000 4 row(s) returned 0.000 sec / 0.000 sec
19 13:09:07 select * from PARTS LIMIT 0, 1000 5 row(s) returned 0.000 sec / 0.000 sec
20 13:09:26 select * from CATALOG LIMIT 0, 1000 9 row(s) returned 0.000 sec / 0.000 sec
21 13:09:50 SELECT DISTINCT P.pname FROM Parts P, Catalog C WHERE P.pid = C.cid LIMIT 0, 1000 5 row(s) returned 0.000 sec / 0.000 sec
```

-- Query 2

select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where not exists (select C.sid from CATALOG C where C.sid = S.sid and C.pid = P.pid));

The screenshot shows the MySQL Workbench interface. The SQL editor contains the following query:

```
123 • lists (select P.pid from PARTS P where not exists (select C.sid from CATALOG C where C.sid = S.sid and C.pid = P.pid));
```

The Output pane shows the execution plan and results. The results are as follows:

#	Time	Action	Message	Duration / Fetch
27	13:11:18	select P.pname from PARTS P, CATALOG C, SUPPLIERS S where P.pid = C.pid and C.sid = S.sid and S.sname = 'Acme Widget'	2 row(s) returned	0.000 sec / 0.000 sec
28	13:16:20	select * from SUPPLIERS LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
29	13:16:32	select * from PARTS LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
30	13:16:48	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
31	13:19:22	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
32	13:19:41	select * from PARTS LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
33	13:19:46	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
34	13:23:45	SELECT DISTINCT C.sid FROM Catalog C WHERE C.cost > (SELECT AVG (C1.cost) FROM Catalog C1 WHERE C1.cost > C.cost)	2 row(s) returned	0.000 sec / 0.000 sec
35	13:25:07	SELECT P.pid, S.sname FROM Parts P, Suppliers S, Catalog C WHERE C.pid = P.pid AND C.sid = S.sid AND S.sname = 'Acme Widget'	6 row(s) returned	0.000 sec / 0.000 sec
36	13:26:10	select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where not exists (select C.sid from CATALOG C where C.sid = S.sid and C.pid = P.pid));	1 row(s) returned	0.000 sec / 0.000 sec

-- Query 3

select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where P.color = 'Red' and (not exists (select C.sid from CATALOG C where C.sid = S.sid and C.pid = P.pid)));

The screenshot displays the MySQL Workbench interface. The main editor window contains a SQL query with line numbers 49 through 55. The query is as follows:

```
49 WHERE C1.pid = P.pid);
50
51 -- Query 2
52 select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where not exists (select C.sid from CATALOG C
53 -- Query 3
54 select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where P.color = 'Red' and (not exists (select
55 -- Query 4
```

The interface includes a left-hand sidebar with a 'Navigator' pane showing 'MANAGEMENT' (Server Status, Client Connections, Users and Privileges, Status and System Variables, Data Export, Data Import/Restore) and 'INSTANCE' (Startup / Shutdown, Server Logs, Options File). Below this is the 'PERFORMANCE' section with 'Dashboard', 'Performance Reports', and 'Performance Schema Setup'. The bottom-left pane shows 'Administration' and 'Schemas' tabs, with 'Information' selected, displaying 'No object selected'.

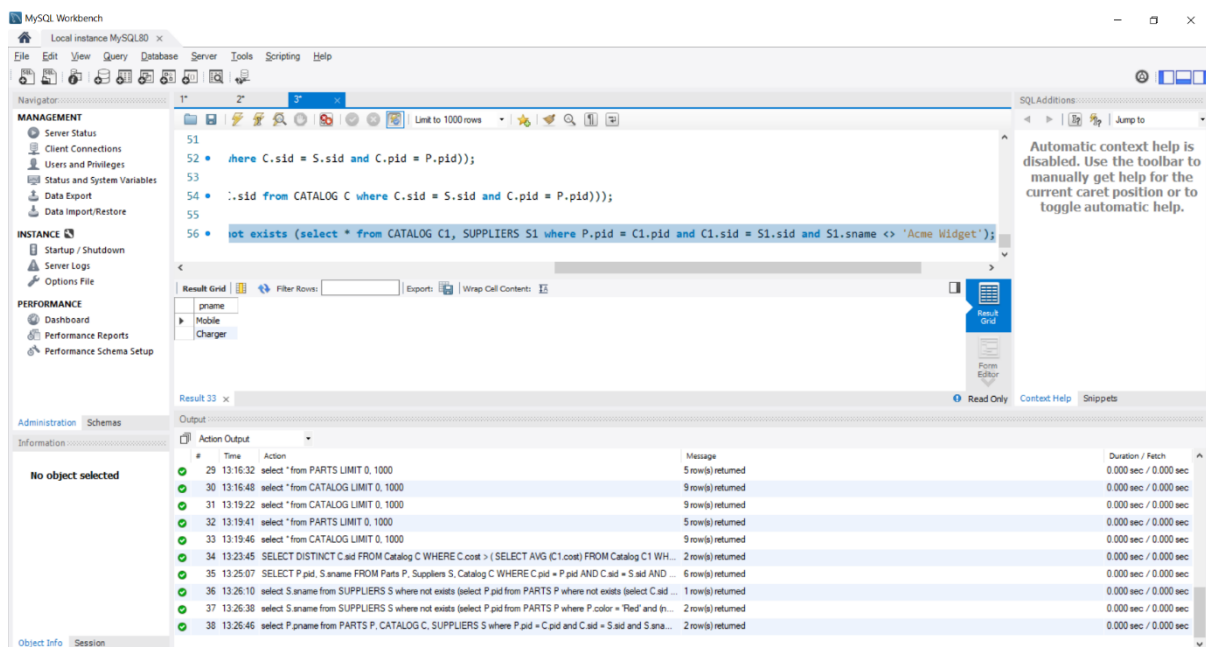
The main editor window has a toolbar with icons for file operations, query execution, and result viewing. Below the editor is a 'Result Grid' tab, which is currently empty. To the right of the editor is a 'SQLAdditions' pane with a message: 'Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.'

At the bottom of the interface is an 'Output' pane showing 'Action Output'. It contains a table with columns: #, Time, Action, Message, and Duration / Fetch. The table lists 13 rows of query execution details, including the time taken for each query and the number of rows returned.

#	Time	Action	Message	Duration / Fetch
28	13:16:20	select * from SUPPLIERS LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
29	13:16:32	select * from PARTS LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
30	13:16:48	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
31	13:19:22	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
32	13:19:41	select * from PARTS LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
33	13:19:46	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
34	13:23:45	SELECT DISTINCT C.sid FROM Catalog C WHERE C.cost > (SELECT AVG (C1.cost) FROM Catalog C1 WH...	2 row(s) returned	0.000 sec / 0.000 sec
35	13:25:07	SELECT P.pid, S.sname FROM Parts P, Suppliers S, Catalog C WHERE C.pid = P.pid AND C.sid = S.sid AND ...	6 row(s) returned	0.000 sec / 0.000 sec
36	13:26:10	select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where not exists (select C.sid ...	1 row(s) returned	0.000 sec / 0.000 sec
37	13:26:38	select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where P.color = 'Red' and (n...	2 row(s) returned	0.000 sec / 0.000 sec

-- Query 4

select P.pname from PARTS P, CATALOG C, SUPPLIERS S where P.pid = C.pid and C.sid = S.sid and S.sname = 'Acme Widget' and not exists (select * from CATALOG C1, SUPPLIERS S1 where P.pid = C1.pid and C1.sid = S1.sid and S1.sname <> 'Acme Widget');



The screenshot shows the MySQL Workbench interface. The SQL editor contains the following query:

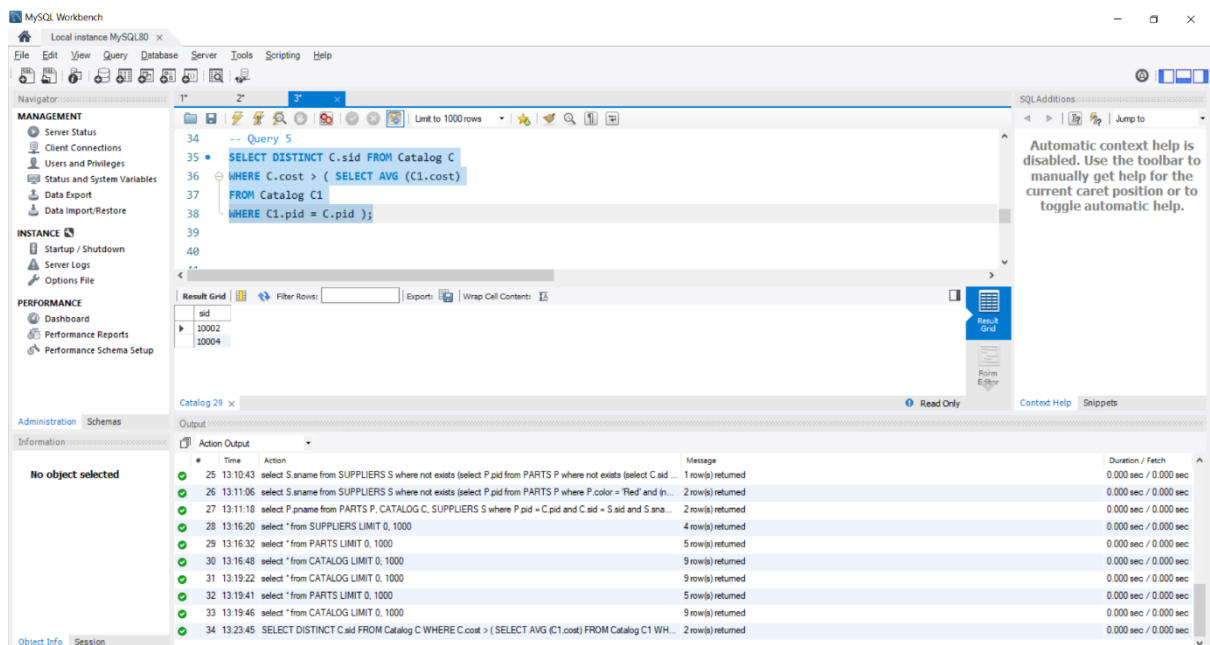
```
51
52 .here C.sid = S.sid and C.pid = P.pid));
53
54 .:sid from CATALOG C where C.sid = S.sid and C.pid = P.pid));
55
56 not exists (select * from CATALOG C1, SUPPLIERS S1 where P.pid = C1.pid and C1.sid = S1.sid and S1.sname <> 'Acme Widget');
```

The Results tab shows the output of the query. The query is a complex join and exists clause query. The output shows the results of the query, including the pname column. The results are as follows:

#	Time	Action	Message	Duration / Fetch
29	13:16:32	select * from PARTS LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
30	13:16:48	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
31	13:19:22	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
32	13:19:41	select * from PARTS LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
33	13:19:46	select * from CATALOG LIMIT 0, 1000	9 row(s) returned	0.000 sec / 0.000 sec
34	13:23:45	SELECT DISTINCT C.sid FROM Catalog C WHERE C.cost > (SELECT AVG (C1.cost) FROM Catalog C1 WH...	2 row(s) returned	0.000 sec / 0.000 sec
35	13:25:07	SELECT P.pid, S.sname FROM Parts P, Suppliers S, Catalog C WHERE C.pid = P.pid AND C.sid = S.sid AND...	6 row(s) returned	0.000 sec / 0.000 sec
36	13:26:10	select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where not exists (select C.sid ...	1 row(s) returned	0.000 sec / 0.000 sec
37	13:26:30	select S.sname from SUPPLIERS S where not exists (select P.pid from PARTS P where P.color = 'Red' and (n...	2 row(s) returned	0.000 sec / 0.000 sec
38	13:26:46	select P.pname from PARTS P, CATALOG C, SUPPLIERS S where P.pid = C.pid and C.sid = S.sid and S.sname...	2 row(s) returned	0.000 sec / 0.000 sec

-- Query 5

```
SELECT DISTINCT C.sid FROM Catalog C
WHERE C.cost > ( SELECT AVG (C1.cost)
FROM Catalog C1
WHERE C1.pid = C.pid );
```



-- Query 6

SELECT P.pid, S.sname

FROM Parts P, Suppliers S, Catalog C

WHERE C.pid = P.pid

AND C.sid = S.sid

AND C.cost = (SELECT MAX(C1.cost)

FROM Catalog C1

WHERE C1.pid = P.pid);

The screenshot displays the MySQL Workbench interface. The central editor shows the following SQL query:

```
-- Query 6
SELECT P.pid, S.sname
FROM Parts P, Suppliers S, Catalog C
WHERE C.pid = P.pid
AND C.sid = S.sid
AND C.cost = (SELECT MAX(C1.cost)
FROM Catalog C1
WHERE C1.pid = P.pid);
```

The 'Result Grid' tab is active, showing the following data:

pid	sname
20001	Acme Widget
20004	Acme Widget
20005	Acme Widget
20001	Johns
20002	Johns
20003	Relance

The 'Output' tab is also visible, showing a log of database actions and their durations. The bottom status bar indicates 'No object selected'.